

AD-A286 509



ON PAGE

Form Approved
OPM No. 0704-0188

Public reporting
maintaining the
for reducing this
the Office of Inf

response, including the time for reviewing instructions, searching existing data sources gathering and
ording this burden estimate or any other aspect of this collection of information, including suggestions
operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to
in, DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE November 1993		3. REPORT TYPE AND DATES COVERED Final	
4. TITLE AND SUBTITLE Tradition, Technology, and the Changing Roles of Women in the Navy				5. FUNDING NUMBERS C - N00014-91-C-0002 PE - 65154N PR - R0148	
6. AUTHOR(S) JW Fletcher, JS McMahon, AO Qvester					
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Center for Naval Analyses 4401 Ford Avenue Alexandria, Virginia 22302-0268				8. PERFORMING ORGANIZATION REPORT NUMBER CRM 93-201	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Chief of Naval Operations N81 The Pentagon, Room 4A530 Washington, D.C. 20350-1000				10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES					
12a. DISTRIBUTION/AVAILABILITY STATEMENT Cleared for Public Release Distribution Unlimited				12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) The attitudes of the population at large and the expectations of young men and women about appropriate gender roles have undergone a major transformation over the past three decades. Reflecting this transformation, public opinion about the propriety of women serving in the armed forces has also shifted over time. In this paper, we review traditions that have fostered the exclusion of women from military service and explore how technological change and the nature of modern warfare will affect that tradition of exclusion. We consider some of the advantages and disadvantages of enlarging the proportion of women in the Navy. We also consider the implications of these changes on the traditional division of labor in the society at large.					
14. SUBJECT TERMS Attitudes (inclinations), demography, enlisted personnel, naval personnel, personnel retention, women				15. NUMBER OF PAGES 42	
				16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT CPR		18. SECURITY CLASSIFICATION OF THIS PAGE CPR		19. SECURITY CLASSIFICATION OF ABSTRACT CPR	
				20. LIMITATION OF ABSTRACT SAR	

Tradition, Technology, and the Changing Roles of Women in the Navy

Jean W. Fletcher • Joyce S. McMahon
Aline O. Quester

Center for Naval Analyses

4401 Ford Avenue • P.O. Box 16268 • Alexandria, VA 22302-0268

94-36115



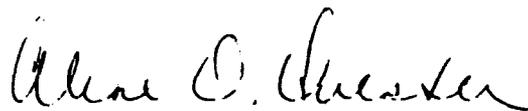
358

DTIC QUALITY INSPECTED 5

94 11 25 07 9

Approved for distribution:

November 1993

A handwritten signature in cursive script, appearing to read "Aline O. Quester".

Aline O. Quester, Director
Resource Analysis Research Department

This document represents the best opinion of CNA at the time of issue.
It does not necessarily represent the opinion of the Department of the Navy.

Cleared for public release: distribution unlimited.

CONTENTS

	Page
Illustrations.....	iii
Technology and tradition.....	1
Forces for change.....	5
Historical overview of women's participation in the U.S. Navy.....	7
Technological change: impeding or improving opportunities for women?.....	12
Navy women's recent experience.....	17
Questions concerning the expansion of Navy women's roles: a research agenda.....	25
Bibliography.....	31

Accession For	
NTIS GRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	

ILLUSTRATIONS

	Page
1 Percentage of women, aged 20-64, in the labor force.....	1
2 Occupational distribution of enlisted women in the Navy.....	4
3 Women's labor force participation by age, 1940-1950.....	8
4 Women in the U.S. Navy, 1970-1992.....	10
5 Marine Corps Marathon results by gender, 1992.....	14
6 Difference between women's and men's first place times.....	14
7 Continuation rates for enlisted recruits entering the Navy in FY 1982.....	19
8 Gender composition of Navy enlisted occupational groups, 1993.....	23

The attitudes of the population at large and the expectations of young men and women about appropriate gender roles have undergone a major transformation over the past three decades. Reflecting this transformation, public opinion about the propriety of women serving in the armed forces has also shifted over time.¹ In this paper, we review traditions that have fostered the exclusion of women from military service and explore how technological change and the nature of modern warfare will affect that tradition of exclusion. We consider some of the advantages and disadvantages of enlarging the proportion of women in the Navy. First, let us briefly consider the implications of these changes for traditional division of labor in the society at large.

Technology and tradition

Throughout this century, but particularly since 1950, changes in technology have blurred the traditional distinctions between the characteristics of men's work and women's work. At the start of the century, work was quite specialized by gender. Work demands in the home—food preparation, laundry, child care—were usually the responsibility of the women. Men were more likely to be found selling their labor in urban labor markets or in agriculture.

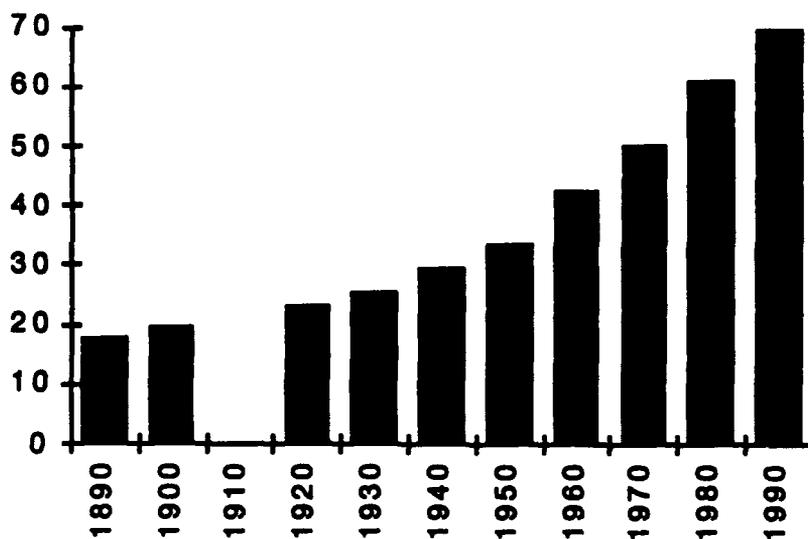
The reasons for these workplace specializations relate to available technologies in the market and the home, as well as to traditions reinforced by sociological norms and biological differences. Explaining labor market segregation at the beginning of the century is beyond the scope of this effort. Instead, we will try to disentangle forces responsible for the changes we have witnessed since then. And the changes have been dramatic. In terms of proportions of the labor market involved, the shift of women's productive activities in the century, from work inside the home to work outside the home, is larger than the overall shift from agricultural to nonagricultural employment that occurred earlier. While technology played an important role in accelerating both of these structural shifts in economic activity, tradition probably slowed the processes of change.

¹A survey reported in the *Report to the President of the Presidential Commission on the Assignment of Women in the Armed Forces* (1992) found that slightly over half those polled thought women should be drafted in the event of a crisis requiring conscription. Wilcox (1992) finds strong public support for military gender integration (except in ground combat units).

What kinds of changes have been important? Improvements in technology increased the number of labor-saving devices in the home, and more goods that were formerly produced in the home can now be purchased relatively cheaply outside it. Physical strength became less important in many jobs, as technology changed methods of production in the workplace. The decline in the birth rate, partly the result of an improvement in reproductive technology, also reduced work demands in the home and provided more time for work outside the home. Improved reproductive technology also provided women with greater ability to control the timing of childbirth, thereby facilitating the pursuit of long-term career goals for women with families.

These advances in technology changed the relative returns for women working inside and outside the home. As it became relatively more profitable for women to work outside the home, women shifted their place of work. Using decennial Census data, figure 1 details this shift. Because the figure plots only the proportion of women working or seeking work outside the home at the time of each Census, it ignores an increase in this proportion that occurred during World War II. Although the magnitude of this expansion in women's labor

Figure 1: Percentage of women, aged 20-64, in the labor force



Source: 1890-1980 from *Economic Report of the President*, January 1987 (p. 211); 1990 from *Employment and Earnings*, January 1991.

market participation is somewhat controversial,² we believe that the increased and varied commitment of women to work outside the home during World War II represents a critical watershed, and we plan to return to a fuller discussion of its importance later in the paper.

Just as technology changed the production of goods in the civilian sector, technology has changed the military and the way we think about and wage war. Technological change has reduced the importance of physical strength for many military jobs. Increasingly, available technologies have also blurred the distinction between combat and combat support roles. No longer do we anticipate World War I style trench wars, with a clear demarcation of the battlefield. On one hand, over-the-horizon strategies suggest that military forces will be geographically separated; on the other, situations like Bosnia suggest that everyone in an area, military and civilian alike, is at risk. In brief, few scenarios now imagine situations with risk as sharply delineated between military personnel in combat-support and in combat activities as has been true in the past.

Still, while the proportion of women in our military is the highest of any country in the world,³ only about 10 percent of our military personnel are women. And, the jobs women hold in the military are predominately jobs the civilian economy characterizes as traditionally female ones (see figure 2). For example, in the U.S. Navy, of the roughly 8,000 women officers, 30 percent are nurses; of the 48,000 enlisted women, 61 percent of those "rated" (i.e., skill-qualified)⁴ hold jobs that involve clerical, medical, or food preparation duties.⁵

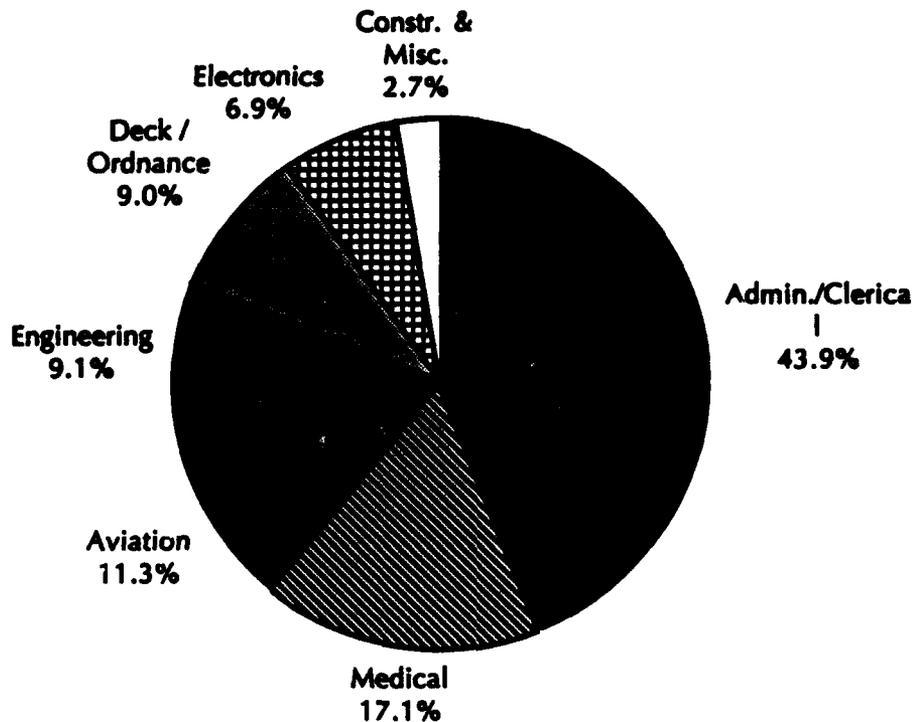
²According to *Historical Statistics of the United States, Colonial Times to 1970* (p. 132), the female labor force participation rate in 1945 was 35.8 percent for all women (not just those aged 20-64), up from 25.8 percent in 1940. By 1950, this rate had dropped to 29.9 percent. The controversy involves both an accurate measurement of the proportion of women working during the war as well as the extent of the drop in labor force participation after the war.

³Canada and Israel are close in percentage but have much smaller forces. See the *Presidential Commission on the Assignment of Women in the Armed Forces* (1992), p. C-31, for country comparisons.

⁴In the Navy, occupations are called ratings. One-third to one-half of entering Navy personnel are not rated. They will be used in general detail jobs (airman, seaman, and fireman). They may, or may not, become rated (occupationally qualified) during the first term of service.

⁵On the other hand, even though women sailors are disproportionately found in this occupational subset, the gender mix of these occupations in the Navy is different from that in the civilian sector. For example, while 94 percent of civilian nurses are women, only 74 percent of Navy nurses are women. And 80 percent of enlisted administrative, medical, and food preparation workers are men.

Figure 2: Occupational distribution of enlisted women in the Navy



Source: Tabulations of occupational qualified enlisted personnel from the Navy Enlisted Master Record File, June 1993

Gender disparities in occupational distribution also exist in the civilian economy, although the extent of occupational segregation, particularly in such professional occupations as law and medicine, has declined dramatically in the last thirty years.⁶ Much public discourse about inherent gender differences, unit morale, and exposure to risk surrounded the integration of police and fire-fighting forces, but this integration is perceived as being successful, even though the proportions of women in occupations of this type remain small.⁷

⁶See, for example, Beller (1985) and Blau and Hendricks (1979).

⁷Women as a percentage of police, detectives, sheriffs, and bailiffs rose from 6.2 percent in 1980 to 12.5 percent in 1992 (*Employment and Earnings*, January 1981 and January 1993), and women were 20 percent of the more general protective services occupational group (includes those listed above as well as corrections officers and guards) by 1993 (Library of Congress, 1993). By comparison, women make up 15 percent of the Master at Arms occupational specialty in the Navy. Firefighters, whose close quarters and unusual shifts perhaps more closely mirror conditions in military units, are still overwhelmingly male (96.7 percent) even though the percentage female has doubled over the past decade.

Let us briefly examine the current forces for change in the role of women in the U.S. military. Then, we will turn to a more detailed history of the role of women in the U.S. Navy and the current tensions between technology and tradition, and among utilization, opportunity, and cost.

Forces for change

Gender issues in the military gained visibility through women's participation in the Panama and Persian Gulf operations in 1989 and 1991, respectively.⁸ Combat exclusion⁹ appeared to isolate women from some of the rewards but not necessarily the risks of military service. In the spring of 1991, the Defense Advisory Committee on Women in the Service (DACOWITS) voted to ask the Secretary of Defense to request repeal of combat restrictions for women. By December of that year, Congress had voted to allow women officers to be assigned to combat aviation and had authorized a commission to study the matter.¹⁰ Subsequently, many Americans were further sensitized to issues of gender discrimination and sexual harassment by the public discussion of Justice Clarence Thomas's Senate confirmation hearings. The publicity surrounding the Tailhook incident heightened social awareness of the disparity between the equality of opportunity to choose occupation in the civilian sector and the formal limitations on the roles of women in the military.¹¹

The President's Commission on the Assignment of Women in the Armed Forces issued its report in November 1992. The Commission members were

⁸For a discussion of the effect of media portrayal of women's participation in recent military operations, see Katzenstein (1993).

⁹Language in Section 6015 of U.S. Code 10, passed in 1948, prohibits women from serving on ships expected to be assigned to combat missions. Definitions and explanations of combat exclusions and the risk rule can be found in Becraft (1991); distinctions among types of jobs women can and cannot hold in the military are discussed in Segal (1982).

¹⁰Five retired military officers, two active duty officers, and eight civilians were appointed to the Presidential Commission on the Assignment of Women in the Armed Forces. They were charged by Congress to make recommendations about legislation, standards, and assignments affecting the military service of women. See the Presidential Commission on the Assignment of Women in the Armed Forces (1992) for the membership of and Congressional directions to the Commission.

¹¹The military has long been credited with leading society in racial integration and policies of equality of opportunity by race. With women, however, the combat exclusion and the risk rule (a Department of Defense policy that does not allow women to hold a position in a noncombat unit expected to experience a risk of exposure to hostile fire or capture that is greater than or equal to that of combat units in the same theater) have meant restricted opportunity. In the public debate about the causes of Tailhook, some argue that the restricted roles of women in the Navy indirectly but inevitably lead to subordination and objectification of women.

deeply divided over many issues, so much so that at one point the more conservative members staged a walkout. While the report recommended the elimination of the combat exclusion for combat vessels, the commission members voted to recommend codification of a ban on women flying combat aircraft and a ban on women in ground combat. The reasons cited for continuing the limitations were primarily concerns about the effects of women on unit cohesion and unit morale, the physical performance differences of men and women, and the potential exposure to capture.¹² Other concerns were issues of personal privacy, sexual misconduct, family separation, the effect of pregnancy on deployment, and skepticism about the interest of women in nontraditional military occupations.

Despite the Commission's report, the Secretary of Defense announced recently that the military services would open up more occupations and ships to women, that women would be allowed to compete for combat aircraft assignments, and that a proposal would be forwarded to Congress requesting elimination of combat exclusion. The Navy appeared to be taking the lead in these initiatives. In response to media questions, Secretary Aspin indicated that he hoped these changes would signal to military women that the days of unequal treatment were behind them.¹³

Notwithstanding changes in the political and social climate, substantial resistance to full integration of women in the military persists. While the impersonal, high technology warfare recently observed during Desert Storm makes traditional arguments against women in combat seem less compelling, many insist that physical and psychological barriers to women's participation in combat still exist. Concern about separation of military personnel from young children, particularly when both parents deploy to military conflict, was a disturbing issue for some Americans during the Persian Gulf mobilization. Media discussions of this issue tended to focus on military women, but debate in Congress made it clear that custodial parents sent to the combat zone were both men and women.¹⁴

¹²Presidential Commission on the Assignment of Women in the Armed Forces (1992).

¹³DOD News Briefing, Wednesday, April 28, 1993, by Secretary of Defense Les Aspin and Service Chiefs, Office of the Assistant Secretary of Defense (Public Affairs).

¹⁴See Ebbert and Hall (1993) for a good discussion of this issue (pp. 268-270).

Before discussing the relevance of traditional arguments against women in combat to gender integration of the U.S. Navy, we first review the history of women's service in the U.S. Navy.¹⁵

Historical overview of women's participation in the U.S. Navy

The Navy was the first service to use women in large numbers. The decision by Secretary of the Navy Josephus Daniels to recruit women early in World War I (WWI) required no legal action as the use of women in the military was a sufficiently novel idea that no one had thought to ban it. Almost all of the roughly 13,000 women who served in WWI were either clerical workers or nurses.¹⁶ Women were valued because they were easy to recruit, required little training, and exhibited very few discipline problems. Women were eager to join the Navy for both patriotic and economic reasons. Women yeomen (essentially secretaries) held the same rank and received the same pay as their male counterparts—certainly a situation they were unlikely to encounter in the civilian economy of the time.

Before WWI and between WWI and WWII, women were excluded from Navy service, in the first instance by tradition and in the second by law. An exception existed for nurses who were used in auxiliary status as early as 1908. In both major wars, the role of women was seen as providing support so that more men could be freed from shore-based duty and sent to sea. At the end of each of the major world wars of this century, women constituted roughly 2 percent of the Navy's active duty strength. We sometimes forget, however, how large the U.S. military was during WWII. There were more than 3 million Navy men and women in uniform in 1945. To illustrate the magnitude of the force drawdown after the war, consider that if all the women from WWII had stayed in the Navy, they would have constituted 17 percent of strength in 1950. While much discussion has focused on the military's dismissal of most women after the war,¹⁷ most men were also sent home. The total Navy officer and enlisted strength in 1950 was only 11.5 percent of the

¹⁵For an interesting history of Navy women, see Ebbert and Hall (1993). Unless otherwise noted, factual historical information in the following section comes from that source. Segal and Hansen (1992) provide an interesting analysis of Congressional testimony in the post-war period. An earlier source covering all services is Binkin and Bach (1977).

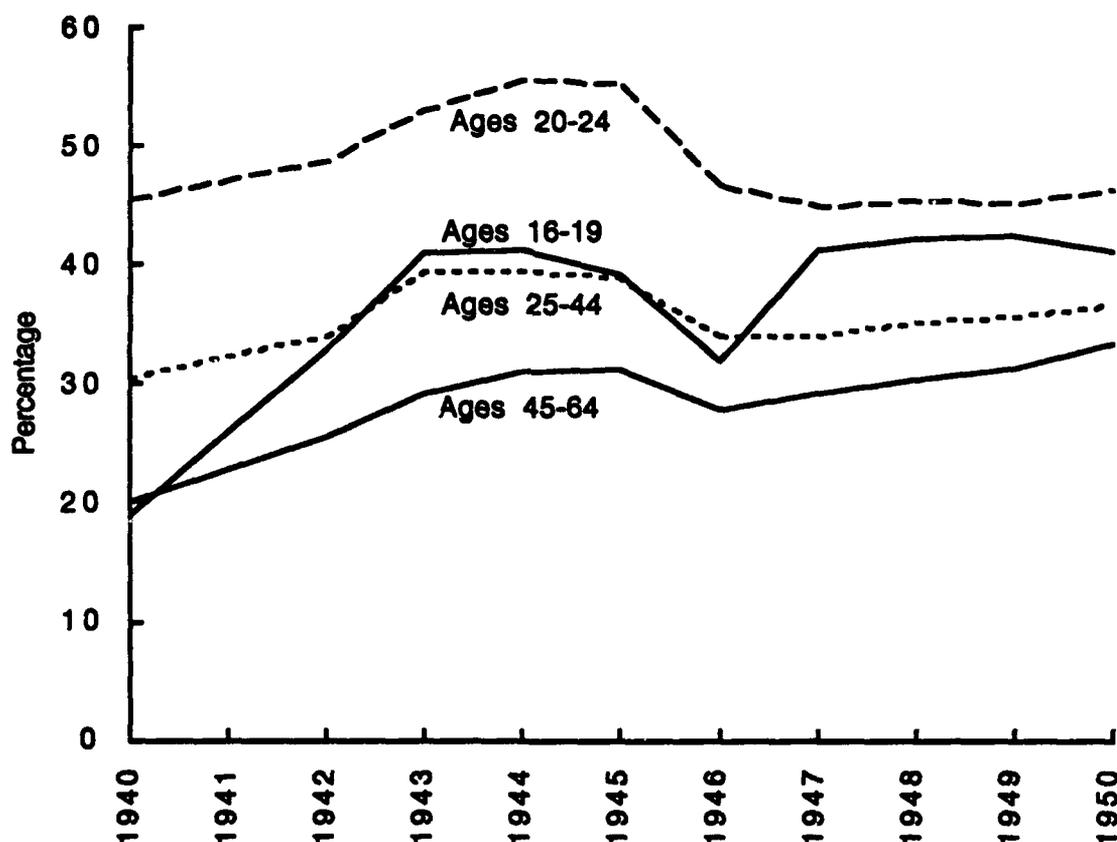
¹⁶Between 20 and 30 percent of all civilian working women in 1920 held one of these occupations (*Historical Statistics of the United States from Colonial Times to 1970*, Table D, pp. 182-232).

¹⁷This is a prominent issue in a popular documentary film, *The Life and Times of Rosie the Riveter*.

wartime maximum.¹⁸ After WWII, the percentage women in the military would remain between 1 and 2 percent for nearly 30 years.

The magnitude of the mobilization of women during WW II is better appreciated if we also consider the unprecedented numbers of women who joined the civilian labor force during the war effort. Figure 3 displays female labor force

Figure 3: Women's labor force participation by age, 1940-1950



Source: *Historical Statistics of the United States, Colonial Times to 1970, Part 1*, page 132. The data for 1941 were not available by the same age categories, so 1941 figures plotted were merely the average of 1940 and 1942 by age categories.

¹⁸Downey (1993) details military strength by service since 1900 in annex A-3.

participation rates throughout the 1940s. Young women experienced the most dramatic changes in labor force participation, and the precedent clearly led to a greater acceptability of labor market attachment for subsequent young women.

Unlike the very limited uses of earlier Navy women, women recruited by the Navy in WWII were used in a variety of occupations. The majority still were nurses and clerical workers, but many were also trained in communications and a range of aviation specialties. In both the Army and the Navy, the aviation communities were more receptive to women in technical and nontraditional female jobs. Perhaps this readier acceptance of women was due to the newer, less tradition-bound nature of these components, or perhaps the newer technology of aviation involved fewer jobs for which physical strength rather than skill training was a primary prerequisite.¹⁹

Women weren't banned from military service after WWII as they had been after WWI, but federal legislation passed in 1948 limited women's terms of enlistment, ranks, benefits, and numbers and specifically excluded women from service in combat positions in the Navy, Marine Corps, and Air Force. Despite the personnel shortages that existed during both the Korean and Vietnam conflicts, women other than nurses were not widely recruited or used in either case. Thus, the contributions of women during WWII did not lead to increased opportunity for women in the military for the two and one-half decades following that war.

The next major change for women in the Navy occurred in the 1970s. After having been capped at less than 2 percent of the active force, limits on the fraction of women in the armed forces were lifted by Congress in 1967. But even by 1972, women made up only 1.6 percent of active military strength. Concerns about recruiting a volunteer force, the political and social pressure evidenced by Congressional passage of the Equal Rights Amendment,²⁰ and the policies of Chief of Naval Operations Zumwalt eventually led to greater utilization of women. A decade later, women constituted over 7 percent of the active force, and women

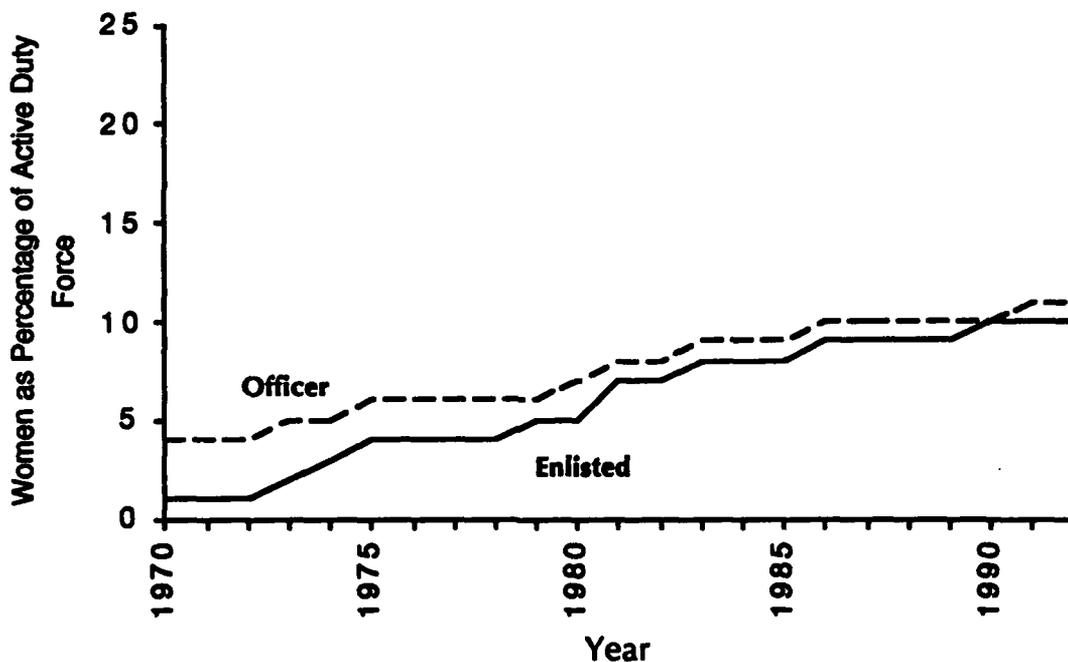
¹⁹The U.S. Air Force did not exist as a separate service until 1945. The greater dependence on women in aviation has continued to the present; the Air Force consistently had the highest percentage of female accessions during the 1980s and 1990s. In 1992, greater than 20 percent of Air Force enlisted recruits were women.

²⁰This amendment was not ratified by a sufficient number of states to become part of the Constitution.

were being trained as naval aviators, routinely assigned to service on certain classes of noncombatant ships, and admitted to all Navy occupations, although with stringent limits on their numbers in certain seagoing occupations.²¹ Women's assignment to noncombat ships gradually expanded in the late 1970s following a ruling in a class-action discrimination suit that automatic exclusion of women from service on ships was unconstitutional.²² In 1988, assignments to ships in the combat logistics force were opened to women.

Figure 4 shows the growth in women's participation in the Navy in the modern era. Women now constitute about 10 percent of Navy personnel. The

Figure 4: Women in the U.S. Navy, 1970-1992



Source: Navy Military Personnel Statistics, NAVPERS 15658(A), 1974-1992.

²¹The Navy's need to maintain an acceptable sea/shore rotation rate for the males who can be assigned to combat positions at sea limits the number of women in these occupations. Thus, not all positions ashore in a given occupational field can be given to women; otherwise, there would be no jobs ashore for men on completion of a sea duty tour.

²²For a discussion of this court case (*Owens v. Brown*) and its consequences, see Holm (1982).

Navy primarily hires at the entry level. Thus, the only way the Navy can rapidly increase the percentage of women is through higher accessions or higher retention rates for women than for men. Women were 14 percent of new recruits in 1992 after ranging from 9 to 12 percent over the previous decade.

Interestingly, the increase in the percentage of women in the Navy has not been driven by a shortage of quality male recruits. In the late 1970s, demographers documented the shrinking size of male youth cohorts, fueling fears about the future ability of the services to recruit sufficient numbers of able young men to meet military needs.²³ Because of a combination of the declining availability of good blue-collar jobs in the civilian sector and good entry-level pay in the military, the crisis in recruitment failed to materialize. In fact, all four major services continued to experience increases in the quality distribution of male recruits throughout the 1980s.²⁴

Operation Just Cause (the Panama invasion) and Operation Desert Shield/Desert Storm opened a new era for Navy women. Women's participation in both conflicts was highly publicized. Women made up almost 7 percent of the total U.S. force in the Persian Gulf.²⁵ The 3,700 Navy women deployed to the Persian Gulf constituted slightly less than 5 percent of the Navy forces. Both the Department of Defense and the House Armed Services Committee in their reports on the conflict lauded the performance and contribution of military women.²⁶

Harking back to its early leadership role in the employment of women, the Navy appears to have made a new commitment to the integration of women. In early April 1993, the Chief of Naval Operations, Admiral Frank Kelso, is reported to have endorsed a plan to ask Congress to reverse the long-standing ban on women in combat and to gradually incorporate women into virtually every aspect

²³For a discussion of the youth dearth, see Lockman and Quester (1985).

²⁴Quality, in this context, refers to high school diploma graduates (HSDGs) in the high mental groups (as defined by scores on the Armed Forces Qualification Test). A large body of personnel research has established that HSDG, high mental group recruits have lower attrition, and fewer disciplinary problems, and are generally more successful. See Lockman (1987) and Cooke & Quester (1992).

²⁵We have found estimates ranging from 31,000 to more than 40,000 for the number of U.S. military women in the Persian Gulf conflict (in excess of 33,300 from Becraft (1991, p.1); more than 40,000 from Presidential Commission on the Assignment of Women in the Armed Forces (1992, p. iii); from Aspin and Dickinson (1992, p. 48), more than 35,000 (p. 48); from Ebbert and Hall (1993, p. 267) more than 31,000).

²⁶Department of Defense (1992), Appendix R, and Aspin and Dickinson (1992), p. 49.

of Navy operations.²⁷ Later that same month, the Secretary of Defense and the Chiefs of the Army, Air Force, Navy, and Marine Corps held a press conference to announce major initiatives for the increased use of women in each of the services. The Navy's plans were the most ambitious. (The Air Force, despite having recruited in recent times the largest fraction of women of any service, was widely reported to have been opposed to women in combat aviation.²⁸) Given the Navy's new commitment to greater opportunity for women, will women's roles in the Navy be substantially different from the experience of the past?

Technological change: impeding or improving opportunities for women?

The impact for women of increasing Navy reliance on high technology systems is not readily apparent. On one hand, technological change has greatly reduced the fraction of military jobs requiring physical strength standards that women would be less likely to meet. The reduction in reliance on physical strength and the increasing specialization accompanying technological change have weakened some arguments against employment of women in the military.²⁹ On the other hand, long-range missiles and other weaponry have blurred the distinctions between combat and noncombat jobs.

To the extent that opposition to women in combat is related to values (e.g., women should be protected from danger) rather than effectiveness or efficiency, military technological innovations have an ambiguous effect. The high technology, fluid warfare witnessed in Desert Storm resulted in relatively few U.S. casualties but may have diminished the safety of traditionally noncombat jobs. Media coverage of the Panama and Persian Gulf conflicts made clear the increasingly arbitrary nature of the combat designation. No women were assigned to combat units in the Persian Gulf, yet women constituted approximately 6.8 percent of U.S. forces in theater and made up slightly more than 5 percent of the U.S. fatalities reported; 2 of 21 U.S. service members

²⁷*New York Times*. "Top Admiral Backs Full Combat Roles for Women in Navy," by John H. Cushman, Jr., April 5, 1993.

²⁸The *Baltimore Sun* ("Air Force to stop training women in combat planes," by Richard Sia, April 7 1993, page 1) reported that the Air Force intended to eliminate training for women in aircraft used for combat aviation. The same article indicated that the Air Force Chief of Staff, General McPeak, opposed women serving in combat aviation. The Navy, meanwhile, accelerated its plans for integrating women in combat aviation (*Navy Times*, "17 women aviators to fly combat," by Patrick Pexton, September 27, 1993, page 8).

²⁹This idea has been widely expressed; see, for example, Goldman (1982).

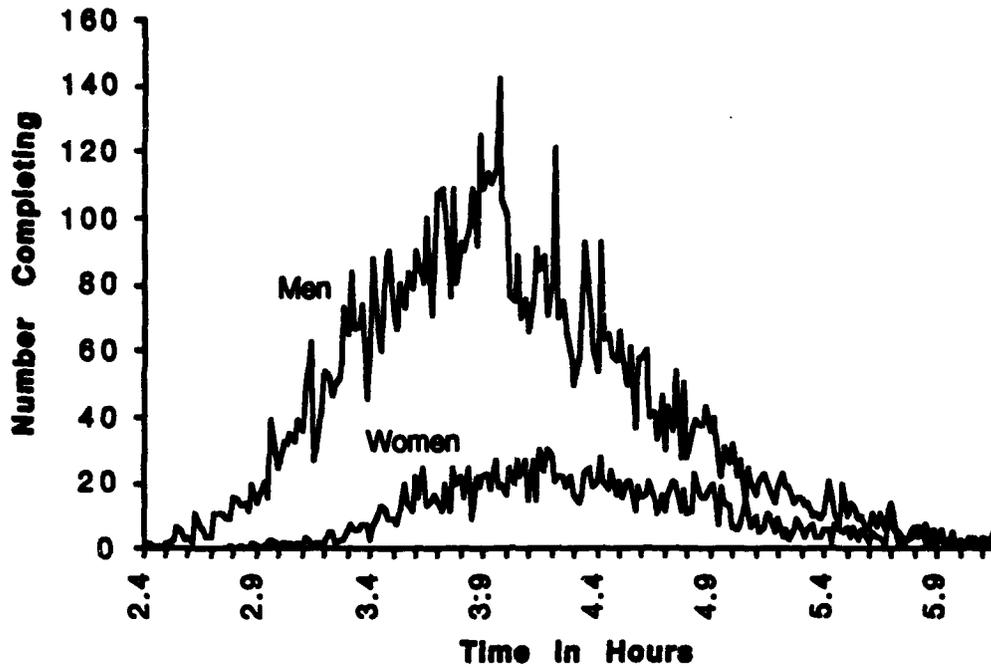
captured as prisoners of war were women.³⁰ Thus, under the view that women should be protected, even noncombat jobs might seem inappropriate for women. Taking the argument a step further, however, modern, high-tech warfare puts civilians at risk as well. Even if one accepts the premise that women should be protected, it is less meaningful to preclude women from combat jobs when risk is so ill defined and broadly shared.

Among military services, technology favors greater use of women in the Navy and the Air Force. In the Army and Marine Corps, there are still a number of jobs that require an unusual degree of strength. This is particularly true in the Marine Corps where 32 percent of the enlisted force is in the infantry. Ground combat troops are required to be able to field march with a heavy pack. In addition, these troops have the potential to engage in direct combat with the enemy, and the issue of absolute physical strength is not irrelevant.

However, even in jobs where strength or other physical attributes are critical, it is important to remember that distributions may be as important as means. For example, just because the average man is taller and heavier than the average woman does not mean that all men are taller and heavier than all women. Completion times for the Marine Corps Marathon illustrate this point. Figure 5 shows the distribution of men and women finishing the 26-mile race by completion time. Clearly, the mean completion time for men is less than the mean completion time for women, but there are a considerable number of women who finished in less time than the average for men. In fact, the first woman finished 116th out of the 11,261 people who completed the race, and the difference was less than 10 percent between the mean completion time for women (4.35 hours) and the mean for men (4.01 hours). Figure 6 illustrates that over time the gap between the top male and female finishers' times has tended to narrow, probably the effect of both changes in preferences by women and the implementation of Title IX legislation interpreted as prohibiting discrimination by gender and hence requiring greater funding of women's sports in educational institutions that receive federal funding. Thus, using gender as a screen for physical attributes may eliminate a large number of qualified people and is becoming a less efficient screen as women's fitness training increases.

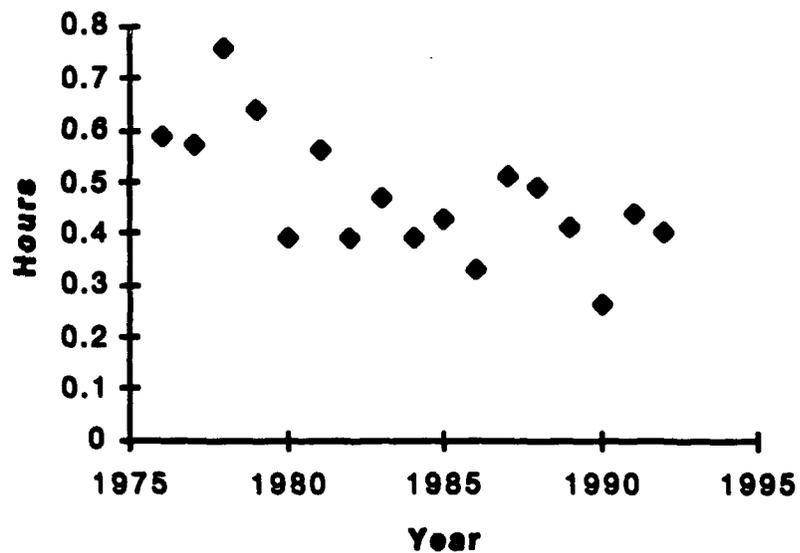
³⁰Calculated from information given in appendices A and R from Department of Defense, *Conduct of the Persian Gulf War, Final Report to Congress*, April 1992.

Figure 5: Marine Corps Marathon results by gender, 1992



Source: XVII Annual Marine Corps Marathon Official Results. There were 11,440 male and 2,890 female entrants; 79 percent of the males and 75 percent of the females completed the marathon.

Figure 6: Difference between women's and men's first place times



Source: XVII Annual Marine Corps Marathon Official Results.

Strength is not the only important physical attribute, however, and in the Navy and Air Force technology often favors people with a compact body type. Ships, submarines, and aircraft are all space-limited, and are friendlier to people who are not tall or bulky. Of the physical attributes of importance in most military jobs—strength, agility, quick reflexes, and endurance—women are at a relative disadvantage only for the first. Strength, however, is probably less important than agility, reflexes, and endurance for both the Air Force and the Navy. In fact, the Navy has very few occupations where unusual strength or physical capabilities are required (SEALs, for example), and these occupations are relatively small in terms of number of people needed.

In the Navy, one would have to go back to sailing ships to find a time when strength played a very important role for a large number of personnel. Climbing riggings and carrying enormous hawsers did indeed require strength, but this is hardly relevant to modern times. In the history of the Navy since World War II, technology has consistently eroded the value of raw strength. The reliance on high-tech equipment has increased the need to enlist intelligent sailors who are adaptable and learn quickly.

The Navy currently requires large numbers of highly skilled, technical officers and enlisted personnel and values retention of those who have received expensive technical training. Given the historical tendency of the military to use women in traditionally female jobs, the well-documented gender differences in propensity to choose technical fields of study tend to limit expectations about the interest of women in Navy service.³¹ Thus, the reluctance of women to choose to work in technical fields would appear to limit the growth of women in the Navy. It is worth remembering, however, that occupational choices are a function of demand and supply interactions. If women perceive that a technical field is not a viable option, due to the resistance of men in that field, a hostile working environment, and a lack of female employees to serve as a buffer, then naturally their desire to enter the field will be dampened.

³¹In 1988, only 14 percent of the bachelor's degrees in engineering and 30 percent of physical science bachelor's degrees were granted to women despite the fact that women constituted more than 50 percent of undergraduates (*Digest of Education Statistics*, 1990). Similarly, more than 90 percent of students enrolled in selected technical vocational education programs in 1980 were male (Gordon, 1991).

In fact, the primary inducement for women to choose such an occupation will be the economic incentive to engage in this type of work. In this sense, the Navy, or indeed the military in general, will have a strong attraction for women. In the rigid pay structure adopted by the military, men and women of equal rank and experience will by and large earn the same wage. Some occupational differences in special pay elements make some military jobs pay more than others, but most military members are paid based solely on longevity and rank. Therefore, any income differential will be a consequence of inability to advance in rank, or of inability to be placed in occupations or assignments with special pay elements.

This greater equality of earnings would tend to attract women to military positions, other things being equal (and later on, we will present some circumstantial evidence that this is so). However, other factors are not equal, or have not been equal in the past. Historically, there has been a negative attitude toward women becoming fully integrated into the military workforce. This attitude is based largely on two factors, a hypothesis that women are less capable of doing the work required by the armed forces and the concern discussed earlier about exposing women to risk.

In the high-technology environment of the modern Navy, physical requirements are unlikely to bar women from many occupations. On the other hand, the idea that women are not allowed to make their own choices concerning personal risk is becoming increasingly controversial. In fact, the ships that currently employ women may be at very high risk during a war. Supply ships, which do have women on board, are prime targets during war and have few defenses. In any case, the risk aboard ships, submarines, and aircraft would appear to be substantially less than the risk involved in direct ground combat.

Some might believe that a discussion of women, the Navy, and technology would include an extensive discussion of equipment design. Historically, personnel considerations rarely have played a major role in the Navy's choice of technology, especially weapon technology. In the last two decades, human factors engineering has increasingly been a part of the planning of Navy systems, and there has been a trend toward more reliance on labor-saving technological changes (hydraulic lifts for cargo handling, for example). However, gender

considerations have been absent from the process until very recently. Introducing women onto combat vessels will require some facility redesign, mostly compartmentalizing sleeping quarters and bathrooms.³² These redesign costs are minimal for new construction and only loom large in discussions for current ships because defense dollars are so scarce.

To summarize, it appears that technological change has been generally favorable to integration of women. The exclusion of women from the military was based primarily on traditions and values.

Navy women's recent experience

Given the impetus for expanding women's roles explained earlier, the issues confronting the Navy involve not just how and by how much to increase the numbers of women in the Navy but also how to effectively and efficiently integrate women into the surface and aviation communities. In what ways will the inclusion of greater numbers of women change the characteristics, behavior, and performance of the enlisted and officer forces? While many questions remain unanswered due to the relative absence of historical data, a number of studies in the past decade, many of them performed at the Center for Naval Analyses, have compared the characteristics and behavior of women and men in the Navy.

Most of our discussion will concentrate on enlisted women. The Navy enlisted force includes approximately 48,000 women and over 400,000 men and is roughly seven times the size of the officer force. Consequently, much of the empirical research on personnel issues has focused on the enlisted force. Officers are college graduates whose occupations are comparable to professional and managerial jobs in the civilian sector, whereas enlisted occupational specialties are more like blue-collar jobs. Analyses of shifts in women's occupational distribution have generally found that there is a much greater tendency toward gender integration in professional and managerial occupations than in blue-collar jobs. For these reasons, we believe that gender occupational integration in the Navy will be easier for officers than for the enlisted force.

³²Mark Thompson, writing in the *Philadelphia Inquirer* ("With women in mind, warships redesigned," August 17, 1993, page 10), reports that it will cost about \$500,000 per ship to modify older vessels for inclusion of women.

A fact well known to military personnel planners, but perhaps not always appreciated by the academic community, is the high level of attrition during the first term of enlistment. In the Navy, initial enlistment contracts range from two to six years, with four years as the most popular first-term contract length. The average first-term contract is for slightly over four years. Out of every 100 new accessions in the Navy, only about 65 complete the first term of service: perhaps 8 out of every 100 drop out during the boot camp period, another one or two leave during occupational training that follows boot camp, and the others drop out over the course of the first-term enlistment contract period. Although this turnover behavior is not so different from that of young adults in the civilian sector (college completion rates, job changes, etc.), there are some important differences related to who pays for training. Unlike the civilian sector, the Navy both provides considerable up-front training and pays full wages during the training period. If a recruit leaves before he or she has become productive (or before there has been a payback period for the training), training dollars are wasted. The cost of such attrition has led researchers to focus on the recruit characteristics that are associated with successful adaptation to military life.

As noted earlier, high school graduation and score on the Armed Forces Qualification Test (AFQT) are the Navy's primary indicators of recruit quality. Because the numbers of women accepted have always been quite small relative to the eligible female population, the Navy and the other services have tended to accept only high-quality female recruits. Furthermore, because a very small proportion of eligible females have been recruited in the past and because a larger fraction of women than men graduate from high school,⁵³ even major increases in the accession levels of women are likely to continue to increase the average quality of enlistees. Most of the enlistment standards work was done with reference to males, so an important question is whether the same quality screens are relevant for female recruits. As accessions of women began to increase in the late 1970s, studies generally demonstrated that the same factors useful for predicting success for male recruits were also good predictors for women.⁵⁴

The Navy places great reliance on skilled, experienced personnel. Having no ground combat function, the Navy has greater need for highly trained

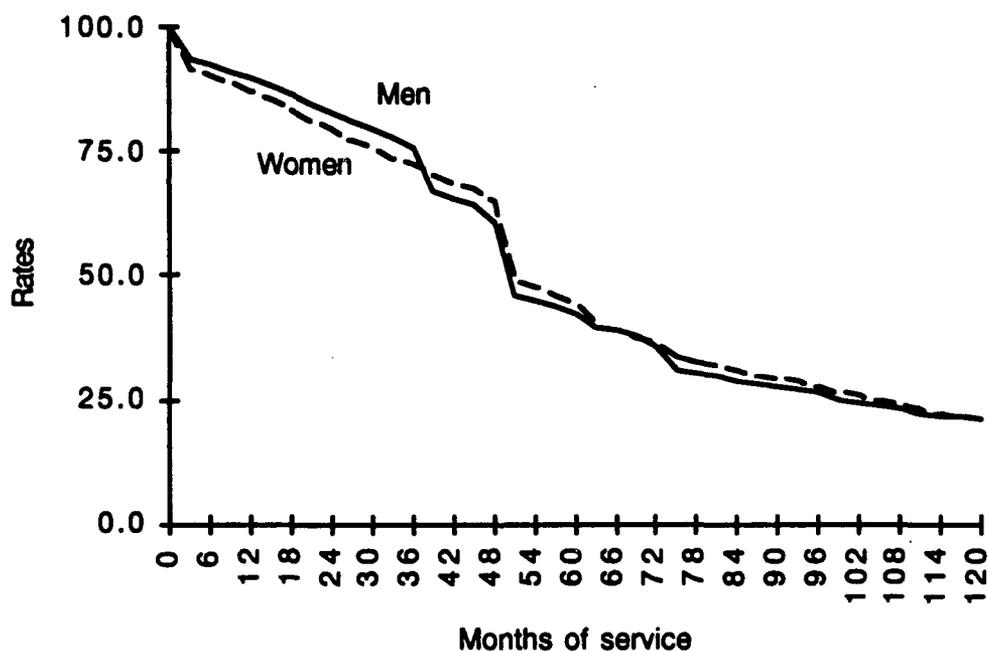
⁵³*Digest of Education Statistics* (1990), National Center for Education Statistics, p. 110.

⁵⁴See Lockman and Lurie (1980) and Lurie (1982).

technicians to maintain and operate advanced systems; therefore, first-term personnel are a lower fraction of the enlisted force in the Navy. A number of studies have compared the attrition behavior of male and female Navy enlisted personnel for various time periods and lengths of service. Consistent findings are that women's early service attrition rates are slightly higher than those for men.³⁵ The gender difference in attrition declines over time, however, and women actually have somewhat higher average first-term reenlistment rates than do men.³⁶

Figure 7 displays the continuation profiles by gender for the non-prior-service recruits entering the Navy in FY 1982. Quester (1988) found that women's

Figure 7: Continuation rates for enlisted recruits entering the Navy in FY 1982



Source: 1992 CNA SCREEN data base (documented in Cooke and Quester, 1990).

³⁵See Quester & Murray (1986), Cymrot (1986b), Cooke & Quester (1989) and Quester (1990a).

³⁶These results are found for both prior-service and non-prior-service recruits. See, for example, Cymrot (1986a), Quester (1988), Cooke and Quester (1989), and Shiells and McMahon (1995). Similar results were reported for Marine Corps women in Quester, North, & Kimble (1989). Kostiuk & Follman (1988) also found higher retention rates for women in the Navy Selected Reserve. On the officer side, McMahon (1989) found that female and minority Navy physicians had higher retention rates than did white males.

historical retention and promotion rates compared favorably with those of men in the same enlistment programs. Evidence from recent cohorts, then, would not lead us to expect that increasing the numbers of women in the Navy would result in fewer experienced personnel. In fact, overall long-term retention is higher for women than for men. The patterns are particularly interesting when we look more closely at the data. Table 1 displays the percentage of those enlisted personnel entering the Navy in FY 1978 through FY 1983 who were still on active duty after 75 months.³⁷ The significantly larger retention rates for African-Americans, particularly African-American women, are again testament to the military services' reputation for having much more equal opportunity than is available in the civilian economy.³⁸

Because retention (firm tenure) is an overall benchmark of employee satisfaction, women appear to be at least as satisfied as men with their career opportunities in the Navy.³⁹ Gender differences in pay, of course, are considerably larger in the civilian sector and there is much greater variance in

Table 1: Retention rates for FY 1978-1983 enlisted cohorts

<u>Demographic category</u>	<u>Percent still on active duty 75 months after initial enlistment</u>
Women	
African-American	45.8
Latina	35.5
All Other	28.1
Men	
African-American	35.0
Latino	29.2
All other	26.3

Source: 1992 CNA SCREEN data base (documented in Cooke and Quester, 1990).

³⁷The Navy has a number of different enlistment programs with contract obligations ranging from two to six years. Seventy-five-month retention was chosen because, by that time, all remaining personnel will have made a reenlistment decision.

³⁸A recent *Wall Street Journal* article (Rochelle Sharpe, "Losing Ground: In Latest Recession, Only Blacks Suffered Net Employment Loss," September 14, 1993) reported that African American workers were disproportionately represented among those who lost jobs in the most recent recession. In 1992, earnings of African American full-time workers averaged only 77 percent of those earned by other workers (calculated from median weekly earnings of full-time wage and salary workers by selected characteristics, *Employment and Earnings*, January 1993).

³⁹In a 1985 DOD survey, a higher percentage of both officer and enlisted women reported being satisfied or very satisfied with their military life than did their male counterparts (Quester, 1988).

pay across occupations, so Navy women may just feel relatively well paid given their civilian alternatives.

Table 2 compares the ratio of female to male average pay in selected occupations for 1992. For the civilian sector, these ratios will be affected by gender differences in the age and experience distribution as well as any wage discrimination. For the Navy pay ratios, gender differences in pay result from differences in rank and assignment type (special pays are given for arduous assignments, such as sea duty, overseas duty, and hazardous duty). Because women are barred from service on many ship classes, occupations in which men spend a lot of time at sea will have larger gender pay differentials in the Navy. Also because women's accession percentages have grown over the past two decades, enlisted women have lower average rank than do men. The two occupation groups for which the civilian pay ratio is significantly higher than the

Table 2: Relative pay and occupational distribution for selected civilian and Navy occupations

Occupation group	Female to male earnings ratio		Percentage female	
	Navy	Civilian	Navy	Civilian
Dental Technician (DT)	0.93	1.15	32	98
Electrician (EM)	0.74	0.83	5	1
Health Technician (HM)	0.94	0.83	20	78
Legal Assistant (LN)	0.96	0.86	37	79
Machinist (MM)	0.66	0.67	2	5
Office Supervisor (YN)	1.03	0.68	21	56
Payroll Clerk (DK)	0.95	0.73	16	90
Police (MA)	0.89	0.81	15	15
Postal Clerk (PC)	0.84	0.95	18	43
Average over all occupations (not just those listed above)	0.89	0.75	10	43

Note: Abbreviations are in parentheses for the Navy Ratings containing job components similar to the civilian occupation listed. Please note that the Navy and civilian jobs are not equivalent because Navy occupational specialties will frequently have job duties that overlap with several or no civilian occupations.

Source: The Navy Recruiting handbook was used to identify civilian occupations with job components similar to Navy occupational specialties. Earnings ratios were calculated for civilian occupations from median weekly earnings of full-time employees (*Employment and Earnings*, January 1993) and for Navy ratings from the Joint Uniform Military Pay System data for December 1992. Navy earnings data calculations include basic and special pays but do not include bonuses, housing and food allowances, or estimated tax benefit.

military pay ratio are dental technicians, who are almost all female in the civilian sector, and postal clerks, who are primarily unionized Postal Service employees in the civilian sector. The two Navy occupational specialties shown here for which the pay ratio is smallest are two sea-duty-intensive occupations. When women are allowed to do the same things as men in the Navy, they will be paid more and hence will have greater incentive to choose these jobs.

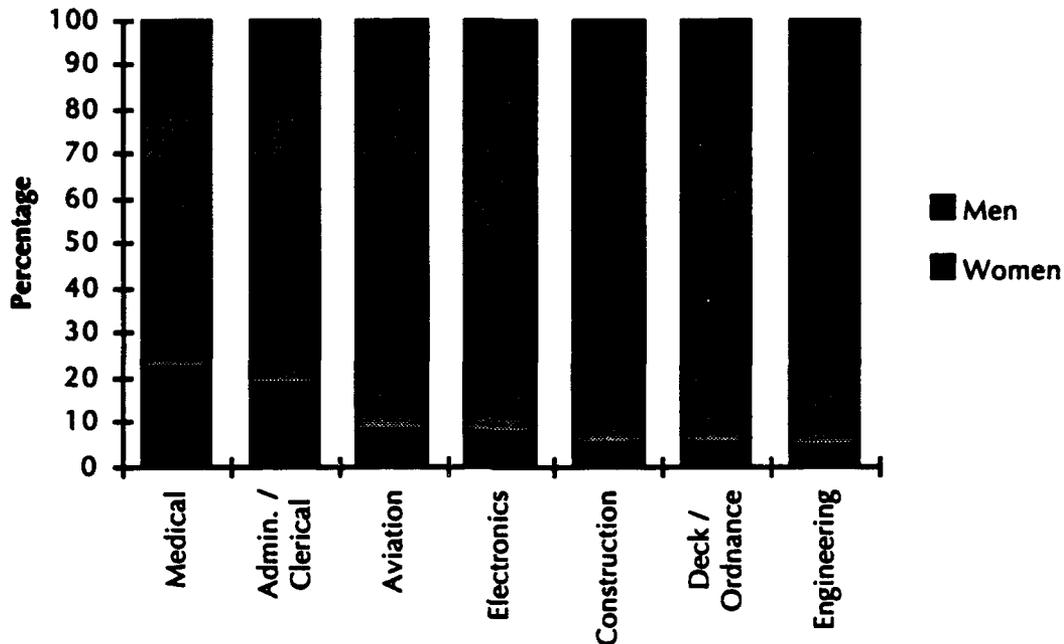
Increases in the number of women serving in the Navy are not likely to dramatically alter the retention patterns for enlisted personnel; therefore, let us examine some other issues that have been seen as impediments to increasing women's roles in the Navy. First is the issue of whether sufficient numbers of women would be able and willing to hold technical and nontraditional, sea-intensive jobs. Figure 8 shows the inventory proportion by gender for enlisted personnel in the Navy as of June 1993.⁴⁰ Because accession goals for women have historically been low and recruiters had to attract a much larger fraction of the eligible male population, a much larger proportion of the males were recruited with guarantees for particular types of technical skill training.

One factor that is perhaps not well understood outside the Navy is the very substantial difference in job experience that will occur as the Navy opens up more opportunities to women. Currently, most enlisted women enter the Navy at the age of 18 to 20 with enlistments that vary in length from three to six years. Most of them do not go to sea, but instead occupy jobs in the shore establishment. The combat exclusion law limits the number and types of ships to which women can be assigned. If Congress lifts this exclusion, as the Navy and Department of Defense have suggested, increasingly more women will go to sea. Whether or not these opportunities will broaden the appeal of the Navy for women is an open question.

At least some recruiters believe that many of these young women are more attracted by administrative jobs within the shore establishment than by the opportunities for nontraditional jobs at sea. These beliefs, however, are fostered by historical recruiting patterns that focused on spending recruiting resources to attract men, not women, and on an incentive system that rewarded recruiters

⁴⁰The data displayed in the figure are restricted to rated (occupationally qualified) personnel.

Figure 8: Gender composition of Navy enlisted occupational groups, 1993



Source: Navy Enlisted Master Record File, June 1993.

much more for bringing in men. During a recent period (late FY 1992 and early FY 1993), recruiters were given the same credit they normally receive for enlisting men for recruiting women. This resulted in an excess supply of women for these jobs. For the college-educated officers, most observers believe that the changes in assignment availability will increase the supply of qualified women desiring a career in the Navy.

The research that exists on women in nontraditional military jobs is encouraging. In a study that looked across services, Waite and Berryman (1985) found no significant difference in the turnover rates of military women in traditionally female and traditionally male jobs, and they further found that women in the military exhibited much lower turnover than women in the civilian sector. McDonald and McMahon (1992) tracked those recruited in FY 1987 through FY 1990 and found very little difference in the first-term completion rates of comparable groups of women and men, even when they were split into shore-intensive and sea-intensive occupation groups. They also reported that women

were less likely than men to be placed in the occupation promised upon entry, a fact that might have been expected to diminish female continuation rates.

While data on productivity are extremely limited for women in the Navy, the few studies of women's job performance do not conclude that the greater integration of women would degrade performance. Thomas and Greebler (1983) surveyed crews of eight noncombatant ships one to two years after the integration of women into their crews. They concluded that integration was considered successful and led to no perceived decline in readiness. A study of Navy Surface Warfare Officers found that women had higher qualification rates than men, although the number of women in the community was very small and women had lower graduation rates from the surface warfare officer basic school.⁴¹

Studies of disciplinary problems and demotions in the Navy have consistently found that enlisted women have much lower rates of unauthorized absence, desertion, and demotion than do men.⁴² In fact, a study of days lost from the job by Navy personnel during their first terms of enlistment found that hospitalization was the primary cause of time lost from work for women and disciplinary reasons were responsible for most lost days for men. On average, men were absent 67 percent more days than were women when absences for these two reasons were considered (Thomas, Thomas, & Robertson, 1993).⁴³ Thus, in general, productivity loss due to pregnancy is not a legitimate issue in the greater employment of women. A concern that remains is whether unanticipated pregnancies result in a greater disruptive influence on deployments than do the types of absences from work experienced by men.

Again, because such a small fraction of eligible women were recruited by the Navy in the past, recruiters could be very selective about the female recruits they admitted. Very little effort has been exerted specifically to attract women, so those volunteering are no doubt highly motivated to join the Navy. Thus, increasing female accessions by a large amount might possibly lead to higher

⁴¹See Cymrot (1990). A study of reserve recruiter productivity [Kostiuk, Follman, & Grogan (1988)] also found that women recruiters were more productive than men, other things equal.

⁴²See Lurie (1983), Quester (1988), and Thomas, Thomas, & Robertson (1993).

⁴³Thomas, Thomas & Robertson (1993) also report results of a field study of all types of absences from work for a sample of enlisted personnel in paygrades E-1 to E-6. They conclude that total hourly absences of men and women do not significantly differ.

levels of attrition and behavioral problems for women than experienced in the past. On the other hand, it is possible that recruiting larger numbers of women, having more women in leadership positions, and giving women access to all possible assignments might make the military experience more hospitable for women and lead to higher retention than in the past.

Despite these recent indications of change, encouraging research findings about women's recent Navy experience, and policy statements on integration, it is not clear what actions the Congress will take. It is likely that substantial opposition to greater reliance on women in the military remains in some quarters. To better understand this resistance to change, we will briefly review the controversies surrounding the employment of women for military service in general and in the Navy in particular. Finally, we will propose a research agenda, the results of which would give substance to discussions about the advantages and disadvantages of expanding the roles of women in the Navy.

Questions concerning the expansion of Navy women's roles: a research agenda

To reiterate, the issues repeatedly raised in the context of gender integration include concerns about unit cohesion, physical standards, risk of capture or death, privacy, sexual misconduct, family separation, pregnancy, and willingness of women to hold nontraditional jobs. Some of these topics are amenable to analysis, others are related to value judgments, and all may be resolved politically. Clearly at issue are cost and effectiveness. Let us consider all of these concerns in the context of the Navy environment and examine the potential contribution of additional research efforts.

The most common arguments fielded against women's participation in combat have to do with issues of physical strength, aggressiveness, and unit cohesion.⁴⁴ We have earlier asserted that the Navy's absence of ground combat forces and heavy reliance on high-technology equipment mitigate the importance of the first two issues. Concerns about deleterious effects of gender integration on unit morale and cohesion also fall largely outside the area of empirical research as there is little historical experience with mixed gender units.

⁴⁴These issues are highlighted in the *Presidential Commission on the Assignment of Women in the Armed Forces Report to the President* and in Tuten (1982).

The very few historical examples of gender integration in the U.S. military are insufficient grounds for making generalizations, but they were generally successful. For instance, during WWII, the Navy Aeronautics Bureau and the Bureau of Medicine integrated women into their training structure, while Navy women in clerical and communication jobs underwent segregated training. Ebbert and Hall (1993) conclude that joint training resulted in greater credibility and acceptance by male colleagues.⁴⁵ Another WWII experiment was the formation by Army Chief of Staff George Marshall of mixed-gender antiaircraft artillery units; the performance of these units was reported to have been superior to that of all-male units.⁴⁶ The participation of women in resistance movements lends credence to the argument that when the cause is considered important enough all useful resources are valued and the participation of women is welcomed.⁴⁷

Little is known about the job performance differences of men and women; in fact, relatively little is known about performance and productivity in general. Studies of proxies for individual and unit performance, such as training success, supervisor ratings, and readiness measures, either have not explicitly compared men and women or have found little difference by gender.⁴⁸

An extensive literature search on unit cohesion and its relation to performance led to the conclusion that task cohesion (pursuit of a common goal requiring cooperation among unit members) rather than social cohesion (emotional bonds of comradeship and caring) is related to performance. While social cohesion seems to be linked to homogeneity of unit members, task cohesion is not.⁴⁹ Given the limited data and extensive nonmilitary research in this area, it seems appropriate to put this issue to rest until and unless experience after integration proves the existence of a problem.

The very same technological innovations that have transformed modern warfare in ways that blur the risk differentials of combatants and noncombatants

⁴⁵Ebbert and Hall (1993), page 71.

⁴⁶This experiment is discussed in Campbell (1992), page 14.

⁴⁷See George Quester (1982) for a discussion of the sketchy existing evidence on the performance of women in combat roles.

⁴⁸In one such study, Byrnes and Marcus (1989) found no significant gender differential in training success for enlisted medical specialized skill training.

⁴⁹MacCoun (1993) surveyed this literature and developed the conclusions stated here.

have apparently also reduced the risk of capture and death for military personnel. Some argue that the American public has a low tolerance for casualties in the post-Vietnam era, and that the political repercussions of casualties have defined the types of military actions the United States has been willing to undertake in recent years. In any case, the dissenting statement to the combat aviation exclusion recommendation of the Commission on the Assignment of Women in the Armed Forces correctly points out that combat exclusion policies have not sheltered women from Prisoner of War status, injury, or death.⁵⁰ The same statement cited testimony discounting fears that male prisoners would be adversely affected by their protective instincts toward women. To deny women the choice of accepting this risk implies that either female lives are inherently more valuable than male lives or that women are not entitled to make (or worse, are not capable of making) informed decisions. We reject both of those premises.

Issues related to privacy, sexual misconduct, and family separation might more properly be categorized as human relations problems than women's issues. Single parenthood has risen rapidly in the past decade. This issue relates to readiness and must be dealt with by the Navy regardless of parental gender. Privacy concerns and problems of sexual misconduct have already been dealt with in the units (including approximately 40 ships) where women now serve. Recent Navy initiatives have put more command attention on sexual harassment and issued guidance on the appropriateness of various behaviors. To the extent that facilities must be modified to increase privacy in a mixed-gender environment, privacy also becomes a cost issue, and assessments are under way in the Navy to estimate the cost of modification for various ship classes.

The question of pregnancy-related absences of Navy women was discussed briefly earlier in the paper, and to some extent the fact that some young women will become pregnant during military service just has to be accepted and adjusted to. The largest problem that pregnancies pose for the Navy is dealing with unanticipated pregnancies during deployment. The assignment process is stressed because pregnant women must be reassigned from deployed ships and are not permitted to go under way for any period after the twentieth week. The great majority of reassignments from ships for reasons of pregnancy are for

⁵⁰Interestingly, five of the seven active duty or retired military officers serving on the commission signed this dissent.

enlisted women in their first terms of service. Age at enlistment is strongly correlated with attrition for reasons of pregnancy for enlisted women. In fact, these attrition rates decline monotonically with age at entry, from 12.9 percent for women entering at the age of 17 to 6.1 percent for women entering at age 25 or older.⁵¹ Large differences in pregnancy rates by ship⁵² may be indicative that leadership and training are key to minimizing pregnancy during sea tours, and special attention should probably be paid to young enlisted women. We must not forget, however, that even though the Navy has longer experience dealing with the problems of young enlisted men, these problems too entail costs. An analysis of the relative costs of the absences from duty of women and men would be informative.

The question of the willingness and eligibility of women for military service in general and the technical jobs in the Navy in particular is a rich area for research. Whether large numbers of women would select a military career, which is after all a very nontraditional choice for women, and then further accept a traditionally male occupation within this traditionally male institution is an important issue to Navy resource managers who must decide how to spend scarce recruiting and training dollars. Because quotas on female accessions have always been very low, it has not been necessary for the Navy to actively recruit young women. Almost all studies of recruiter productivity, advertising effectiveness, and recruiting policy have dealt exclusively with male recruits. Will young women behave similarly?

Navy occupations with the most sea-intensive assignments are also those that typically have the largest bonuses and highest special pays. Women have been legally barred from most of these assignments. As the Navy opens more occupations and assignments, it is important that expectations about women's choices of technical or nontraditional military jobs not be based solely on generalized observations of past behavior—behavior when enlisted women made limited choices under stringent assignment constraints. Instead, it is imperative that we carefully examine the experiences of women, particularly those who have served in sea-intensive occupations, and attempt to discern how women's behavior

⁵¹This result was observed for both Navy and Marine Corps enlisted women. See Quester (1990a) and Quester (1990b).

⁵²Information from briefing by Cdr. Hillery (Pers 409), September 1993.

has varied with the changing recruiting, promotion, compensation, and assignment policies of the past two decades.

For example, several experiments during the past two years varied recruiter incentives for women recruits. The effects of these experiments should be carefully studied, as should the effects on women's continuation and advancement of initial skill training and assignment policies. In fact, a larger fraction of enlisted women than men in recent years has entered the Navy as general detail recruits—those who do not receive formal occupational specialty training except through on-the-job training. General detail recruits initially have the most menial jobs and the highest early attrition. Despite these initial assignments, women's continuation rates by the end of the first term of enlistment are very similar to those for their male counterparts.

The body of empirical research accumulated to date, along with the social and political pressures for gender equity, make this a propitious time to reconsider the traditional limitations on women in the Navy. The obstacles to gender integration that continue to cause concern are questions of preference, availability, and cost. The final question then is whether the net costs of modifying the institution are justified by the increase in the size and quality of the pool of potential enlistees and officers and the improvement in perceptions of equity. We think they are. More study of the accumulated evidence on women's Navy service experiences, combined with an examination of recent recruiting, training, continuation, and advancement experience of young women, would be an excellent complement to this process.

BIBLIOGRAPHY

Aspin, Les and William Dickinson (1992). *Defense for a New Era, Lessons of the Persian Gulf War*, U.S. House of Representatives Committee on Armed Services.

Becraft, Carolyn (1991). *Women in the U.S. Armed Services: The War in the Persian Gulf*, Washington, DC: Women's Research and Education Institute.

Beller, Andrea H. (1985). "Changes in the Sex Composition of U.S. Occupations, 1960-1981," *Journal of Human Resources*, 20.

Binkin, Martin and Shirley J. Bach (1977). *Women and the Military*, Washington, DC: The Brookings Institution.

Blau, Francine D. and Wallace E. Hendricks (1979). "Occupational Segregation by Sex: Trends and Prospects," *Journal of Human Resources*, 14.

Bureau of Labor Statistics, *Employment and Earnings*, U.S. Department of Labor, January 1982, January 1993.

Byrnes, Patricia E. and Alan J. Marcus (1989). *Hospital Corpsman A- and C-School Success: The Effect of Entry Standards*, Center for Naval Analyses Research Memorandum 88-159.

Campbell, D'Ann (1992). "Combatting the Gender Gulf," in *MINERVA: Quarterly Report on Women and the Military*, X, 3 & 4.

Cooke, Timothy W. and Aline O. Quester (1992). "What Characterizes Successful Enlistees in the All-Volunteer Force: A Study of Male Recruits in the U.S. Navy," *Social Science Quarterly*, 72,2.

Cooke, Timothy W. and Aline O. Quester (1990). *Success Changes for Recruits Entering the Navy (SCREEN): An Update*, Center for Naval Analyses Information Memorandum 102.

Cooke, Timothy W. and Aline O. Quester (1989). *Navy First-Term Attrition*, Center for Naval Analyses Research Memorandum 89-17.

Cymrot, Donald J. (1990). *Qualification of Surface Warfare Officers*, Center for Naval Analyses Research Memorandum 89-316.

Cymrot, Donald J. (1986a). *Survival Rates of Prior-Service Recruits, 1978-1984*, Center for Naval Analyses Research Memorandum 86-173.

Cymrot, Donald J. (1986b). *Early Attrition in FY1985: The Effects of the Delayed Entry Program, Accession Month, and Enlistment Program*, Center for Naval Analyses Research Memorandum 86-192.

- Department of Defense (1992). *Conduct of the Persian Gulf War, Final Report to Congress, Appendices A-S.*
- Downey, Robert W. (1993). *U.S. Defense Spending and Force Levels: A Long-Term Perspective*, Center for Naval Analyses Research Memorandum 93-14.
- Economic Report of the President* (1987). Washington, DC: U.S. Government Printing Office.
- Ebbert, Jean and Marie-Beth Hall (1992). *Crossed Currents: Navy Women from WWI to Tailhook*, Washington DC: Brassey's (US).
- Goldman, Nancy L. [ed.] (1982). *Female Soldiers—Combatants or Noncombatants?* Westport, CT: Greenwood Press.
- Gordon, Howard R.D. (1991). *The Role of Women in Vocational Education and Development: A Literature Review*, presented at American Vocational Association Convention.
- Holm, Jeanne (1982). *Women in the Military, An Unfinished Revolution*, Novato, California: Presidio Press.
- Katzenstein, Mary F. (1993). "The Spectacle as Political Resistance: Feminist and Gay/Lesbian Politics in the Military," *MINERVA: Quarterly Report on Women and the Military*, XI, 1.
- Kostiuk, Peter F., Dean A. Follman, and James E. Grogan (1988). *Learning Curves, Personal Characteristics, and Job Performance*, Center for Naval Analyses Research Contribution 584.
- Kostiuk, Peter F. and Dean A. Follman (1988). *Retention of Navy Veterans in the Selected Reserve*, Center for Naval Analyses Research Memorandum 88-72.
- Library of Congress (1993). *Women in Nontraditional Occupations*, Washington, DC: Federal Research Division.
- Lockman, Robert F. (1987). *Trends and Issues in U.S. Navy Manpower*, Center for Naval Analyses
- Lockman, Robert F. and Aline O. Quester (1985). "The AVF: Outlook for the Eighties and Nineties," *Armed Forces and Society*, 11, 2.
- Lockman, Robert F. and Philip M. Lurie (1980). *A New Look at Success Chances of Recruits Entering the Navy (SCREEN)*, Center for Naval Analyses Research Contribution 425.
- Lurie, Philip M. (1982). *Two-Term Survival of Female Personnel*, Center for Naval Analyses Research Contribution 460.